

CLAIMS

I CLAIM:

1. A system for providing fluid to a cup, said cup, as presented in side elevation, having a bottom, a substantially open top and substantially vertically projecting sides, said system further comprising means for accepting fluid projecting through the bottom of said cup, and means for ejecting said fluid into said; said system being distinguished in that:

there is a restriction element frame present at least partially within said cup in a plane which substantially bisects said cup as viewed from thereabove.

2. A system for providing fluid to a cup as in Claim 1, in which said means for accepting fluid is incorporated in a nipple housing which further comprises a rod means situated therewithin such that an annular space is present between said rod means and said nipple housing, said rod means being projected in the plane of said restriction frame element, accessible from atop said cup and functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup via said means for ejecting said fluid.

3. A system for providing fluid to a cup as in Claim 1, wherein the means for ejecting said fluid into said cup ejects fluid substantially laterally along a non-radially oriented locus and without substantial upward or downward components, so that it approaches at an non-normal angle to a substantially vertically

projecting cup side, such that ejected fluid causes a "swirling" motion of fluid present in said cup which tends to prevent solids present therein from settling out thereof.

4. A system for providing fluid to a cup as in Claim 1, wherein the cup has a inner bottom surface characterized by at least one selection from the group consisting of:

is substantially flat, which the substantially vertically projecting sides thereof meet at a substantially ninety degree angle;

is concave upward;

is functionally substantially continuous with a lower portion of means for ejecting said fluid into said cup; and

is located below a lower portion of means for ejecting said fluid into said cup.

5. A system for providing fluid to a cup as in Claim 1, in which said annular space between said nipple housing and said rod means is smaller at its top than it is therebeneath, said annular space having a float therewithin, such that if fluid accumulates within said annular space, said float rises in said annular space and serves to automatically restrict possible rod means motion.

6. A system for providing fluid to a cup as in Claim 5, which further comprises means for preventing fluid which enters said cup from flowing back into a source thereof.

7. A system for providing fluid to a cup as in Claim 5, wherein said rod means projects from said nipple housing through a first seal means which prevents substantially all fluid from passing

vertically therethrough; a lower aspect of said rod means, being substantially abruptly broadened, and there being a second seal means present atop said broadened lower aspect, said second seal being in contact, at an upper aspect thereof, with retaining means in said nipple housing such that when said rod means is positioned to project substantially vertically, fluid present in said nipple housing therebelow can not flow upward, but such that when said rod means is caused to be moved so as to project other than substantially vertically, a flow path is opened past said broadened lower aspect of said rod means, and past said second seal means.

8. A system for providing fluid to a cup, said cup, as presented in side elevation, having a bottom, a substantially open top and substantially vertically projecting sides, said system further comprising means for accepting fluid projecting through the bottom of said cup, and means for ejecting said fluid into said cup, in which said means for accepting fluid is incorporated in a nipple housing which further comprises a rod means situated therewithin such that an annular space is formed between said nipple housing and said rod means, said rod means being accessible from atop said cup and functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup via said means for ejecting said fluid along an substantially horizontally oriented locus;

said annular space between said nipple housing and said rod means being smaller at its top than it is therebeneath, and said annular space having a float therewithin, such that if fluid accumulates within said cup and annular space, said float rises in said annular space and serves to automatically restrict possible rod means motion.

9. A system for providing fluid to a cup as in Claim 8, in which the means for ejecting said fluid into said cup along a substantially horizontally oriented non-radial rather than along a substantially upward or downward oriented radial locus is on an even vertical level with substantially flat upper surface of the bottom of said cup, as viewed in elevation.

10. A system for providing fluid to a cup as in Claim 8, in which said system is further characterized by the presence of a restriction element frame at least partially within said cup in a plane which substantially bisects said cup as viewed from above, said rod means being substantially within the plane of said restriction element frame when it is not moved to cause said means for ejecting said fluid along an substantially horizontally oriented locus to effect fluid ejection.

11. A system for providing fluid to a cup, said cup, as presented in side elevation, having a bottom, a substantially open top and substantially vertically projecting sides, said system further comprising means for accepting fluid projecting through the bottom of said cup, and means for ejecting said fluid into said cup, in which said means for accepting fluid is incorporated in a nipple housing which further comprises a rod means situated therewithin such that an annular space is formed between said nipple housing and said rod means, said rod means being accessible from atop said cup and functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup via said means for ejecting said fluid, along an substantially horizontally, non-radially oriented locus;

said annular space between said nipple housing and said rod means being smaller at its top than it is therebeneath, and said annular space having a float therewithin, such that if fluid

accumulates within said cup and annular space, said float rises in said annular space and serves to automatically restrict possible rod means motion;

said system being further characterized by the presence of a restriction element frame at least partially within said cup in a plane which substantially bisects said cup as viewed from thereabove, said rod means being substantially within the plane of said restriction element frame when it is not moved to cause said means for ejecting said fluid to effect fluid ejection.

12. A system for providing fluid to a cup as in Claim 11, in which the means for ejecting said fluid into said cup along a substantially horizontally, non-radially oriented locus, rather than along a substantially upward or downward oriented radial locus, is on an even vertical level with substantially flat upper surface of the bottom of said cup, as viewed in elevation.

13. A system for providing fluid feed to a cup, said cup, as presented in side elevation, having substantially vertically projecting side(s); said system further comprising means for accepting fluid which project through a lower aspect of said cup, and means for ejecting said fluid along a substantially laterally oriented locus;

said system further comprising a rod means situated substantially within said cup, said rod means being functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup along a substantially laterally oriented locus, rather than along a substantially upward or downward oriented locus, there being no elements present therewithin to influence fluid ejection into said cup along a locus with a generally upward or downward component;

said system being distinguished in that:

there is a restriction element frame present at least partially within said cup in a plane which substantially bisects said cup as viewed from above, said rod means being projected substantially within the plane of said restriction element frame.

14. A system for providing fluid to a cup as in Claim 13, where the means for ejecting said fluid into said cup ejects fluid substantially laterally along a non-radially oriented locus without substantial upward or downward components, so that it approaches at an angle to a substantially vertically projecting cup side, such that ejected fluid causes a "swirling" motion of fluid present in said cup which tends to prevent solids present therein from settling out thereof; and

wherein the cup has a inner bottom surface characterized by at least one selection from the group consisting of:

is substantially flat, which the substantially vertically projecting sides thereof meet at a substantially ninety degree angle;

is concave upward;

is functionally substantially continuous with a lower portion of means for ejecting said fluid into said cup; and

is located below a lower portion of means for ejecting said fluid into said cup.

15. A system for providing fluid to a cup comprising:

a cup;
a nipple housing;
a rod means;
means for accepting fluid; and
a restriction element frame;

said cup, as presented in side elevation, being substantially open at the top thereof, having substantially vertically projecting side(s), and having a bottom which is substantially closed except for an opening for receiving said nipple housing;

said nipple housing being essentially tubular in shape and being essentially vertically projected through the bottom of said cup;

said nipple housing further comprising at least first and second diameter reducing restrictions therewithin with the first thereof being positioned above the second thereof, below each of said first and second diameter reducing restrictions there being at least one seal means, said nipple housing further comprising at least one hole through the essentially vertical projection thereof at a vertical location below the vertical level of the top of said cup and above the vertical level of the bottom of said cup;

said means for accepting fluid being present in said nipple housing and being comprised of a hole, which hole is functionally sealed with a pressure operated back-flow preventing plug means until source fluid, provided externally, presents sufficient pressure on said pressure operated back-flow preventing plug means to effect entry through said hole;

said rod means being substantially of one diameter over the majority of its length; but having a substantially abrupt larger

diameter near its lower aspect, said substantially abrupt larger diameter portion having upper and lower surfaces;

said rod means being positioned in said system for providing fluid to a cup such that it projects substantially vertically, upwardly out of said nipple housing through the seal means associated with the first restriction simultaneous with the upper surface of said rod means substantially abrupt larger diameter near its lower aspect, being in contact with the seal means associated with the second restriction;

such that in use source fluid is provided in contact with the back-flow preventing plug means at a sufficient pressure to cause said back-flow preventing plug means to allow said source fluid entry into said nipple housing, wherein it contacts the lower surface of said substantially abrupt larger diameter of the lower aspect of said rod means;

and further such that when said rod means is,

by application of physical force to its upper end which projects through the seal associated with the first restriction in said nipple housing and out of said nipple housing,

caused to project other than substantially vertically, and

while said seal means associated with the first restriction continues to prevent substantially all fluid from flowing there-past,

said seal means associated with the second restriction is caused to receive and allow fluid to pass substantially vertically therethrough and thereafter be ejected from said at least one

hole through the vertical projection of said nipple housing, said fluid being ejected in a substantially laterally oriented direction into said cup, there being no elements present therewithin to influence fluid ejection into said cup along a locus with a generally upward or downward component;

said system being distinguished in that:

said restriction element frame is present at least partially within said cup in a plane which substantially bisects said cup as viewed from above, said rod means being projected substantially within the plane of said restriction element frame.

16. A system for providing fluid to a cup as in Claim 15, in which there are three to six holes through the vertical projection of said nipple housing at vertical location(s) below the vertical level of the top of said cup and above the vertical level of the bottom of said cup;

said fluid being ejected into said cup in a substantially laterally oriented direction, through each thereof along a locus selected from the group consisting of:

radially so as to directly approach a substantially vertically projecting cup side; and

non-radially so that it approaches at an angle to a substantially vertically projecting cup side;

and

wherein the cup has a inner bottom surface characterized by a selection from the group consisting of:

is substantially flat, which the substantially vertically projecting sides thereof meet at a substantially ninety degree angle; and

is concave upward;

said cup inner bottom surface being at a location selected from the group consisting of:

even with the liquid being ejected into said cup in a substantially laterally oriented direction; and

vertically above the fluid being ejected into said cup in a substantially laterally oriented direction.

17. A method of providing animals a fluid comprising the steps of:

a) providing a system for providing fluid feed to a cup, said cup, as presented in side elevation, having a substantially open top and substantially vertically projecting side(s); said system further comprising means for accepting fluid projecting through a lower aspect of said cup, and means for ejecting said fluid along a substantially laterally oriented locus; said system for providing fluid feed to a cup further comprising a rod means situated substantially within said cup, said rod means being functionally incorporated with said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup along a substantially laterally oriented locus via said means for ejecting fluid, said system having elements which directs ejected fluid along a non-radial locus and having no elements to influence fluid ejection into said cup along a locus with a generally upward or downward component;

said system being further characterized by having a restriction element frame at least partially within said cup in a plane which substantially bisects said cup as viewed from above, said rod means being projected substantially within the plane of said restriction element frame;

b) making a source of fluid available to said means for accepting fluid, external to said cup;

c) allowing animals access to said rod means;

such that said animals cause said rod means to be moved with the accompanying result being that fluid enters into said cup along a non-radial locus which is substantially laterally oriented without upward or downward component imposed thereupon by system elements.

18. A method of providing animals a fluid comprising the steps of:

a) providing a system for providing fluid to a cup comprising:

- a cup;
- a nipple housing;
- a rod means; and
- means for accepting fluid;
- a restriction element frame;

said cup, as presented in side elevation, being substantially open at the top thereof, having substantially vertically projecting side(s), and having a bottom which is substantially closed except for an opening for receiving said nipple housing;

said nipple housing being essentially tubular in shape and being essentially vertically projected through the bottom of said cup;

said nipple housing further comprising at least first and second diameter reducing restrictions therewithin with the first thereof being positioned above the second thereof, below each of said first and second diameter reducing restrictions there being at least one seal means, said nipple housing further comprising at least one hole through the essentially vertical projection thereof at a vertical location below the vertical level of the top of said cup and above the vertical level of the bottom of said cup;

said means for accepting fluid being present in said nipple housing and being comprised of a hole, which hole is functionally sealed with a pressure operated back-flow preventing plug means until source fluid, provided externally, presents sufficient pressure on said pressure operated back-flow preventing plug means to effect entry through said hole;

said rod means being substantially of one diameter over the majority of its length, but having a substantially abrupt larger diameter near its lower aspect, said substantially abrupt larger diameter portion having upper and lower surfaces;

said rod means being positioned in said system for providing fluid to a cup such that it projects substantially vertically, upwardly out of said nipple housing through the seal means associated with the first restriction simultaneous with the upper surface of said rod means substantially abrupt larger diameter near its lower aspect, being in contact with the seal means associated with the second restriction;

such that in use source fluid is provided in contact with the back-flow preventing plug means at a sufficient pressure to cause said back-flow preventing plug means to allow said source fluid entry into said nipple housing, wherein it contacts the lower surface of said substantially abrupt larger diameter of the lower aspect of said rod means;

and further such that when said rod means is,

by application of physical force to its upper end which projects through the seal associated with the first restriction in said nipple housing and out of said nipple housing,

caused to project other than substantially vertically, as viewed in side elevation, and

while said seal means associated with the first restriction continues to prevent substantially all fluid from flowing vertically there-past,

said seal means associated with the second restriction is caused to receive and allow fluid to pass substantially vertically therethrough and thereafter be ejected from said at least one hole through the vertical projection of said nipple housing, said fluid being ejected in a along a substantially laterally oriented direction into said cup, said system having elements present therewithin which direct fluid to be ejected along a non-radial locus, but having no elements present therewithin to influence fluid ejection into said cup along a locus with a generally upward or downward component;

said system being further characterized by said restriction element frame being at least partially within said cup in a plane

which substantially bisects said cup as viewed from above, said rod means being substantially within the plane of said restriction element frame.

b) making a source of fluid available to said means for accepting fluid, external to said cup;

c) allowing an animal access to said rod means within the plane of said restriction element frame;

such that said animal causes said rod means to be moved with the accompanying result being that fluid enters into said cup via said at least one hole through the vertical projection of said nipple housing, along a locus which is substantially non-radial and laterally oriented and which has substantially no upward or downward component imposed thereupon by system elements.

19. A method as in Claim 17, in which the fluid is liquid animal feed having solids suspended therewithin.

20. A method as in Claim 18 in which the fluid is liquid animal feed having solids suspended therewithin.

21. A system for providing fluid feed to a cup, said cup, as presented in side elevation, having substantially vertically projecting side(s); said system further comprising means for accepting fluid which project through a lower aspect of said cup, and means for ejecting said fluid into said cup along a substantially laterally oriented locus;

said system further comprising a rod means situated substantially within said cup, said rod means being functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to

enter into said cup, the amount of fluid flow caused being generally greater for a greater amount rod means movement;

said system being distinguished in that there are no elements present therewithin to influence fluid ejection into said cup along a locus with a generally upward or downward component;

said system being characterized in that means for limiting the amount of motion allowable to said rod means is removably affixed thereto and being further characterized by the presence of a restriction element frame at least partially within said cup in a plane which substantially bisects said cup as viewed from above, said rod means being substantially within the plane of said restriction element frame.

22. A system as in Claim 13, which further comprises means for limiting the amount of motion allowable to said rod means, said means for limiting the amount of motion allowable to said rod means being removably affixed thereto.

23. A system as in Claim 15, which further comprises means for limiting the amount of motion allowable to said rod means, said means for limiting the amount of motion allowable to said rod means being removably affixed thereto.

24. A system as in Claim 15, which further comprises means for limiting the amount of motion allowable to said rod means, said means for limiting the amount of motion allowable to said rod means being removably affixed to said nipple housing at the location where said rod means projects substantially vertically, upwardly out of said nipple housing through the seal means associated with the first restriction.

25. A system for providing fluid to a cup comprising:

a cup (C);
a nipple housing (NH);
a rod means (R); and
means for accepting fluid (E6);
a restriction element (RE) frame;

said nipple housing (NH) being located substantially within said cup (C) and comprising structural elements (E1) (E2) (E3) (E4) (E5) and (E6), said structural element (E1) being secured into structural element (E2) from atop thereof, which structural element (E2) is secured into structural element (E3) from atop thereof, and said structural element (E4) being secured into structural element (E5) from beneath thereof, said structural element (E5) being secured into structural element (E6) from atop thereof, and said structural element (E6) being the means for accepting fluid and functionally connected to the means for providing Source Fluid (SF);

said structural elements (E3) and (E5) being the upper and lower portions of a functionally single continuous element;

in said nipple housing there being a first diameter restricting means (FR) formed by at least one of the Structural Elements (E2) and (E3) and a second diameter restricting means (SR) which is formed by at least one of said the Structural Elements (E4) and (E5);

said structural element (E4) having a hole (H) present therein positioned to directly contact source fluid (SF), said hole (H) having a back-flow preventing plug (BF) removably present therewithin;

said rod means (R) being of substantially one relatively small diameter (SD) over the majority of its length, but having a substantially abrupt larger diameter (RLD) near its lower aspect, said substantially abrupt larger diameter portion having upper and lower surfaces, said upper surface being positioned in said nipple housing (NH) so that it contacts a lower seal means (LSM) caused to be present at said second diameter restricting means, an upper surface of the lower seal means (LSM) being secured against said second diameter restricting means (SR) which is formed by at least one of the structural elements (E2) and (E3);

the substantially relatively small diameter (SD) end of said rod means (R) extending out of said cup (C) and being accessible for application of orientation changing pressure thereto;

a spring element (SE) being present between said lower surface of said substantially abrupt larger diameter (RLD) and said back-flow preventing plug (BF), said spring element (SE) serving to maintain said contact between the upper surface of said substantially abrupt larger diameter (RLD) of said rod means (R) and a lower surface of said lower seal means (LSM), and simultaneously to maintain source fluid flow preventing position maintaining pressure on the back-flow preventing plug (BF);

said rod means (R) being normally oriented to prevent forward-flow of source fluid past said lower seal means (LSM), but being at least minimally movable within element (E1) through which it projects so as to assume a position which allows a flow path to open between the upper surface of said substantially abrupt larger diameter (RLD) of said rod means (R) and said lower surface of said lower seal means (LSM) through which flow path source fluid (SF) can flow and be ejected laterally through laterally oriented holes in structural element (E3);

said rod means (R) also passing through an upper seal (USM) present at said first diameter restricting means (FR), which upper seal means (USM) prevents substantially all said source fluid (SF) from passing therethrough;

said upper seal means (USM) being maintained in said first diameter restricting means (FR) formed by at least one of the structural elements (E2) and (E3);

such that in use when the portion of said substantially relatively small diameter (SD) end of said rod means (R) which extends out of said cup (C) is caused to be moved from its normal orientation, source fluid (SF) proceeds past said lower seal means (LSM), and exits substantially laterally into said Cup (C) as Fluid Out (FOUT);

said system for providing fluid flow into a cup having elements present therein to direct ejected fluid at the point of its ejection through said laterally oriented holes in said structural element (E3), along a non-radial oriented locus, but having no elements present therein to influence said source fluid (SF) flow to proceed generally upward or downward;

said system being further distinguished in that:

said restriction element (RE) frame is present at least partially within said cup in a plane which substantially contains said rod means and substantially bisects said cup as viewed from above, said restriction element (RE) frame being a continuation of structural element (E1) and comprising upwardly oriented projections to both the right and left as viewed in elevation.

26. A system for providing fluid to a cup, said cup, as

presented in side elevation, having a bottom, a substantially open top and substantially vertically projecting sides, said system further comprising means for accepting fluid projecting through the bottom of said cup, and means for ejecting said fluid into said cup, in which said means for accepting fluid is incorporated in a nipple housing which further comprises a rod means situated therewithin, said rod means being accessible from atop said cup and functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup via said means for ejecting said fluid along an substantially horizontally oriented locus;

said system being further characterized by the presence of a restriction element frame at least partially within said cup in a plane which substantially bisects said cup as viewed from above, said rod means being substantially within the plane of said restriction element frame.

27. A system for providing fluid to a cup as in Claim 26, in which the means for ejecting said fluid into said cup is on an even vertical level with an upper surface of a bottom of said cup, as viewed in elevation.

28. A system for providing fluid to a cup as in Claim 26, in which the means for ejecting said fluid into said cup is a means for ejecting fluid along a substantially horizontally oriented non-radial rather than along a substantially upward or downward oriented radial locus.

29. A system for providing fluid to a cup, said cup, as presented in side elevation, having a bottom, a substantially open top and substantially vertically projecting sides, said system further comprising means for accepting fluid projecting

through the bottom of said cup, and means for ejecting said fluid into said cup along a substantially horizontally oriented non-radial rather than along a substantially upward or downward oriented radial locus, in which said means for accepting fluid is incorporated in a nipple housing which further comprises a rod means situated therewithin, said rod means being accessible from atop said cup and functionally incorporated into said means for accepting fluid such that movement of said rod means causes said means for accepting fluid to allow fluid to enter into said cup via said means for ejecting said fluid along an substantially horizontally oriented locus;

said system being further characterized by the presence of a cup which has a substantially flat upper surface of the bottom thereof such that said substantially flat upper surface meets the substantially vertically projecting sides at substantially a ninety degree angle.

30. A system for providing fluid to a cup as in Claim 29, in which the means for ejecting said fluid into said cup along a substantially horizontally oriented non-radial rather than along a substantially upward or downward oriented radial locus is on an even vertical level with substantially flat upper surface of the bottom of said cup, as viewed in elevation.

31. A system for providing fluid to a cup, said cup, as presented in side elevation, having a bottom, a substantially open top and substantially vertically projecting sides, said system further comprising means for accepting fluid projecting through the bottom of said cup, and means for ejecting said fluid into said;

said system being distinguished in that:

said means for ejecting said fluid into said cup ejects fluid substantially laterally along a non-radially oriented locus and without substantial upward or downward components, so that it approaches at an non-normal angle to a substantially vertically projecting cup side, such that ejected fluid causes a "swirling" motion of fluid present in said cup which tends to prevent solids present therein from settling out thereof.